

SUPPORT FOR THE AMENDMENTS

Claims 2-4 were previously canceled.

Claims 1 and 5-9 are amended herein

Claims 11-19 are added.

The amendment to Claims 1 and 5-9, as well as the introduction of Claims 11-19, are supported by original Claims 1-10 and the specification at page 4, line 15 to page 5, line 18.

No new matter has been added by the present amendment.

REMARKS

Claims 1 and 5-19 are pending in the present application.

At the outset, Applicants wish to thank Examiner Nguyen for the helpful and courteous discussion with their undersigned Representative on February 25, 2011. During this discussion, Applicants' undersigned Representative presented various amendments and arguments in traverse of the outstanding rejections including those presented herein. The content of the February 25, 2011, discussion is believed to be reflected in the following comments. Reconsideration of the outstanding rejections is requested.

The rejection of Claims 1 and 5-10 under 35 U.S.C. §103(a) over Roewer et al (US 5,716,590) in view of Manougue et al (US 6,548,720) and Berty (US 5,021,282) is respectfully traversed.

The presently claimed invention provides, *inter alia*, a process for preparing trichlorosilan ( $\text{HSiCl}_3$ ) by catalytic hydrodehalogenation of silicon tetrachloride ( $\text{SiCl}_4$ ) in the presence of hydrogen and a supported catalyst at a temperature in the range from 300 to 1000°C, wherein said catalytic hydrodehalogenation comprises contacting said supported catalyst with a  $\text{SiCl}_4/\text{H}_2$  mixture having a molar ratio of from 1:0.9 to 1:20,

wherein said supported catalyst has a catalyst content, calculated as element, of from 0.1 to 10% by weight and comprises at least one metal or metal salt selected from the group consisting of calcium, strontium, barium, calcium chloride, strontium chloride, and barium chloride,

wherein said at least one metal or metal salt has been applied to a support selected from the group consisting of leached glass, fused silica, a porous siliceous support and a  $\text{SiO}_2$  support,

wherein said catalytic hydrodehalogenation is conducted in a fixed-bed reactor, in a fluidized-bed reactor or in a moving-bed reactor, and

wherein said catalytic hydrodehalogenation is conducted at a temperature in the range from 600 to 950°C and a pressure of from 0.1 to 100 bar abs. (see Claim 1)

Applicants submit that the claimed invention is novel and non-obvious.  
Reconsideration of the outstanding rejections is requested.

The claimed invention is drawn to “a process for preparing trichlorosilan ( $\text{HSiCl}_3$ ) by catalytic hydrodehalogenation of silicon tetrachloride ( $\text{SiCl}_4$ ) in the presence of hydrogen, in which at least one metal or metal salt selected from among the elements of main group 2 of the Periodic Table of the Elements is used as catalyst at a temperature in the range from 300 to 1000°C.” (see Claim 1) The Examiner has withdrawn the previous rejection over the combined disclosures of Roewer et al (US 5,716,590) and Corbin et al (US 5,600,040). However, the Examiner has now rejected the claims over the combined disclosures of Roewer et al (US 5,716,590), Manogue et al (US 6,548,720), and Berty (US 5,021,383).

Roewer et al is discussed at page 1, lines 13-25 of the present specification, from which the several advantages and differences of the claimed invention are apparent. Indeed, the Examiner continues to recognize that the claimed method differs from the disclosure of Roewer et al in that this reference does not disclose or suggest the claimed method by using at least one metal or metal salt selected from the group consisting of calcium, strontium, barium, calcium chloride, strontium chloride, and barium chloride as catalyst at a temperature in the range from 300 to 1000°C. However, the Examiner alleges that Roewer et al disclose

hydrodehalogenation in the presences of hydrogen and a supported catalyst at a temperature of 300 - 1000°C.

Specifically, with respect to Roewer et al (US 5,716,590), which corresponds to EP 0 658 359 A2, the Examiner is reminded of the discussion at page 1, lines 13-25 of the present specification, which states:

Various catalysts and the process for converting  $\text{SiCl}_4$  to  $\text{HSiCl}_3$  in the presence of hydrogen have been known for a long time.

Thus, EP 0 658 359 A2, for example, discloses a process for the catalytic hydrodehalogenation of  $\text{SiCl}_4$  to  $\text{HSiCl}_3$  in the presence of hydrogen, in which finely divided transition metals or transition metal compounds selected from the group consisting of nickel, copper, iron, cobalt, molybdenum, palladium, platinum, rhenium, cerium and lanthanum are used as unsupported catalysts, these are able to form silicides with elemental silicon or silicon compounds. Problems are, as a result of the strongly endothermic nature of the reaction, the indirect introduction of the heat of reaction and the sintering of the catalyst particles, associated with a drop in activity. In addition, separation of the used finely divided catalysts from the product mixture represents a considerable expense.

Indeed, from the foregoing, it is clear that the present invention provides an advantage over Roewer et al in that the catalytic hydrodehalogenation of  $\text{SiCl}_4$  to  $\text{HSiCl}_3$  in the presence of hydrogen can be conducted at reduced expense and without the activity drop associated with the strongly endothermic nature of the reaction, the indirect introduction of the heat of reaction and the sintering of the catalyst particles that plagued the method of Roewer et al, which utilized finely divided transition metals or transition metal compounds selected from the group consisting of nickel, copper, iron, cobalt, molybdenum, palladium, platinum, rhenium, cerium and lanthanum as unsupported catalysts.

The Examiner now relies upon Manogue et al and Berty as disclosing hydrodehalogenation catalysts that may contain metal or metal salts of from calcium, strontium, barium, calcium chloride, strontium chloride, and barium chloride. Berty does not disclose the specific metal or metal salts defined in the claimed invention. Nonetheless, the

Examiner appears to rely upon the generic reference to alkali or alkaline-earth carbonates as a general motivation for using group II element, as well as the glass wool support for the catalyst. Applicants dispute this reliance upon Berty noting that absent Applicants' disclosure the artisan would not have made the combination of disclosures as the Examiner alleges. Moreover, there is nothing in Berty to specifically suggest the metals of the claimed invention nor suggest the benefits in using the same.

Manogue et al similarly fails to compensate for the deficiencies in the disclosure of Roewer et al as Manogue et al does not specifically disclose preparing trichlorosilan ( $\text{HSiCl}_3$ ) by catalytic hydrodehalogenation of silicon tetrachloride ( $\text{SiCl}_4$ ) in the presence of hydrogen and a supported catalyst at a temperature in the range from 300 to 1000°C. Manogue et al disclose hydrodehalogenation using a catalyst that includes barium, which the Examiner contends provides a generic motivation for modification of Roewer et al. Applicants dispute this allegation as there is nothing in the cited art that would lead the artisan to any realization that group consisting of calcium, strontium, barium, calcium chloride, strontium chloride, and barium chloride will be comparable to group 2 metals or group 2 salts with respect to catalytic ability for hydrohalogenation as presently claimed.

Nonetheless, to further differentiate the claimed invention from the combination of the cited art, Applicants have amended Claim 1 to include the limitations of previously pending Claims 5-8. Applicants submit that the cited art fails to specifically disclose these additional limitations in a single embodiment. Thus, the claims as presented would not be obvious over the cited art.

In view of the foregoing, Applicants respectfully request withdrawal of this ground of rejection.

Applicants submit that the present application is now in condition for allowance.

Early notification of such action is earnestly solicited.

Respectfully submitted,

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